

simple spring mechanism. Applicant submits that one of ordinary skill in the art would be able to make and use propellers that fold when not spinning.

**The Rejection of Claims 1 and 3 Under 35 USC 102:**

- a. In USPN3,120,359, Sprecher discloses an airship having four engines positioned forward of the center of gravity and spaced equidistant from the fuselage and from each other. The present invention describes a tailsitter flying wing that is not axially symmetric, having a pair of main wings providing aerodynamic lift during forward flight. The engines are neither required to be equidistant from the fuselage nor from each other. The engines are not required to be positioned forward of the center of gravity. Instead, the center of gravity of the entire vehicle should be forward of the center of aerodynamic lift of the pair of main wings.
- b. Sprecher discloses an airship with four engines in various adaptations such as turbo jets, ramjets, atomic power, or controllable rockets. From line 20 on Column 5, Sprecher discloses that (referring to Fig. 5) a power cylinder 142 controls a thrust deflector 143 on engine 22 for aiding roll stability. (Without the deflectors, roll control would have been absent in vertical hover). In the present invention, the preferred embodiment has four counter-rotating propellers, with counter torques of the propellers utilized to provide roll stability control, and no additional control surfaces such as deflectors are needed. (One pair of clockwise spinning propellers produces counterclockwise torques, while the other pair of counter-clockwise spinning propellers produces clockwise torques. Roll stability control is realized by differentiating power to the two pairs of propellers.)
- c. US-2,622,826A describes a tail sitter aircraft with a single large propeller in the nose and two small propellers mounted in the wing tips pointing up and down to balance the torques produced by the main propeller. The present invention has four or more propellers all point to the front in parallel with the fuselage.

- d. US-2,712,420A discloses a tail sitter airplane with two counter-rotating propellers installed in the nose. For hover, large control surfaces must be present to deflect the slipstreams for stability control. The present invention achieves full stability control by differentiating power to the four counter-rotating propellers, without the need for control surfaces for hover flight.
- e. US-3,059,876A describes an airplane that rotates its propellers by 90 degrees between hover and forward flight. The present invention has all propellers fixed and point to the front in parallel to the fuselage.
- f. US-3,096,952A describes an airplane that rotates its engines to achieve controlled hover and forward flight. The present invention has all propellers fixed and point to the front in parallel to the fuselage.
- g. US-3,116,040A describes an aircraft with a rotary wing in the nose. The present invention has a plurality of propellers fixed and point to the front in parallel to the fuselage.
- h. US-5,062,587A and US-5,114,096A describe a tail sitter aircraft with a single large propeller in the nose. For hover, large control surfaces must be present to deflect the slipstreams for stability control. The present invention has four or more propellers all point to the front in parallel with the fuselage.
- i. US-5,765,783A describes a tail sitter aircraft with two large propellers one each wing. Stability control is achieved with collective and cyclic control much like a helicopter. The present invention has four or more propellers all point to the front in parallel with the fuselage.
- j. US-RE36,487E shows a tail sitter aircraft with a single ducted fan. The present invention has four or more propellers all point to the front in parallel with the fuselage.

- k. US-6,561,455B2 describes a hybrid VTOL aircraft with a large rotor in the nose for vertical takeoff (which is stowed in forward flight), and two pairs of ducted fans (one pair is tiltable) for forward flight. The present invention has four or more fixed propellers all point to the front in parallel with the fuselage.

#### **Conclusion**

For all above reasons, applicant submits that the specification and claims all define patentably over the prior art. Therefore he submits that this application is in condition for allowance, which action he specifically solicits.

#### **Conditional Request for Constructive Assistance**

Applicant submits that the specification and claims of this application are proper, definite and define novel structure which is also unobvious. If, for any reason, this application is not believed to be in full condition for allowance, applicant respectfully request the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P. 2173.02 and 707.07(j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.

Very respectfully,



Youbin Mao

430 N. Holliston Ave. #210  
Pasadena, CA 91106  
Tel: (626)676-5879

**Certificate Of faxing:** I certify that on the date below this document and referenced attachments, if any, will be faxed to 703-872-9306 addressed to Commissioner For Patents.

January 20, 2006      Youbin Mao